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***The Credit Channel Transmission of Monetary Policy in
the European Union***

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Abstract

This paper confirms the importance of the financial systems behaviour conditions to the credit channel of monetary policy in the entire European Union (EU). It uses panel fixed-effect estimations and quarterly data for 26 EU countries for the period from Q1 1999 to Q3 2006 in an adaptation of the Bernanke and Blinder (1988) model. The findings also reveal the high degree of foreign dependence and indebtedness of the EU banking institutions and their similar reactions to the macroeconomic and the monetary policy environments.

JEL Classification: E4, E5, G2.

Keywords: European integration; bank credit; monetary policy transmission; panel estimates.

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1. Introduction and Motivation

In a recent survey of the most important topics and academic literature on the development of European banking, Goddard et al. (2007) stress the importance of the credit channel transmission of monetary policy in a world in which monetary policy becomes the most important instrument of stabilisation.

This is particularly true in the European Union (EU), where the process of financial integration has implications for competition in the credit market and the banking institutions may have an important role in the transmission channels of monetary policy.

Recently, several empirical papers have tested the importance of the bank lending channel for the transmission of monetary policies. With regard to Europe, most of them considered only the universe of the Economic and Monetary Union (EMU) and obtained rather similar conclusions on the relative homogeneity of the behaviour of the EU banking institutions and the importance of the banks' liquidity, but not of their size or capitalisation to explain the adjustment of the credit lending to the interest rate variations (Erhmann et al., 2001; Fountas and Papagapitos, 2001; Altunbas et al., 2002; Gambacorta, 2004). Other contributions analyse the financial institutions' role in different subsets of EU countries, some of them considering the new member-states (Golinelli and Rovelli, 2005; Elbourne and de Haan, 2006; Ferreira, 2008).

Few studies consider the universe of all EU countries, taking account of the fact that the introduction of the single currency has accelerated the process of consolidation and financial integration, not only in the EMU, but in the EU as a whole, in which the new member-states also have a voice, despite the possibly heterogeneous nature of their financial systems.

Using quarterly data for the period from Q1 1999 to Q3 2006 (31 quarters) for 26 EU countries and a version of the Bernanke and Blinder (1988), model, this paper seeks to contribute to the empirical study of the credit channel of monetary policy in the entire EU, under the new conditions arising from Europe's financial integration. It tests the importance of some bank performance conditions to the bank lending channel transmission of monetary policy and develops the following vectors of analysis:

- 1) the possible similarities in the behaviour of the banking institutions in the different EU countries;
- 2) the importance of macroeconomic growth and the variation of the monetary policy interest rate to the growth of bank lending;
- 3) the influence on bank-lending growth of the bank performance conditions, here represented by three specific ratios: bank deposits to GDP, bonds and money market instruments to GDP and foreign assets to foreign liabilities.

The letter is organised as follows: Section 2 presents the estimated model and the data used; Section 3 reports the panel estimations and the obtained results and Section 4 presents the concluding remarks.

2. The Model and the Data

We estimate a version of the Bernanke and Blinder (1988) model. Basically, in the money market, we will assume that money equals deposits held at banks by the non-monetary sectors. So, for the demand function (Dep^d), we assume that the nominal deposits held in banks by the private sector will depend on the GDP and the interest rate on bonds (i_{bonds}):

$$Dep^d = \alpha_0 + \alpha_1 GDP + \alpha_2 i_{bonds} \quad (1)$$

Money or deposits supply (Dep^s) will depend not only on the interest rate on bonds (i_{bonds}), but also on the influence of monetary policy (represented here by the relevant monetary policy interest rate, $i_{mon.pol.}$, which is defined by the Central Bank):

$$Dep^s = \beta_0 + \beta_1 i_{bonds} + \beta_2 i_{mon.pol.} \quad (2)$$

In the credit market, the demand for lending ($Lend^d$) depends on the GDP, the interest rate on lending/borrowing (i_{lend}) and the interest rate on bonds (i_{bonds}):

$$Lend^d = \chi_0 + \chi_1 GDP + \chi_2 i_{lend} + \chi_3 i_{bonds} \quad (3)$$

Assuming the relevance of one or more bank-performance characteristics ($Char_x$) to lending, we may define the supply in the credit market ($Lend^s$) as depending on the deposits of the private sector in banks (Dep), as well as on the bank characteristics, the interest rate on lending/borrowing (i_{lend}) and the interest rate on bonds (i_{bonds}):

$$Lend^s = \delta_0 + \delta_1 Dep + \delta_{2x} Car_x + \delta_3 i_{lend} + \delta_4 i_{bonds} \quad (4)$$

Clearing the money and credit markets leads to the reduced form of the model and to the equation that will explain the bank-lending growth:

$$Lend = \varphi_0 + \varphi_1 GDP + \varphi_2 i_{mon.pol.} + \varphi_{3x} Car_x \quad (5)$$

where:

$Lend$ = bank lending

GDP = Gross Domestic Product

$i_{mon.pol.}$ = monetary policy interest rate

Car_x = bank characteristics ($x = 1, \dots, X$)

So, the dependent variable will be the natural logarithm of the ratio of the domestic credit provided by the banking institutions to GDP. In order to explain the growth of this bank lending, we will consider (always in natural logarithms):

- The real GDP, representing the macroeconomic conditions of the different EU countries;
- The discount rate (end of the period), which is the monetary policy interest rate;
- The ratio deposits to GDP, that is, the total deposits in the banking institutions which are important sources of resources for credit lending;
- The ratio bonds and money market instruments to GDP, as a proxy of the development of the financial markets in EU countries, which are mostly bank-dominated;
- The ratio foreign assets to foreign liabilities, representing the financial situation of the banking institutions towards other countries, as they may receive payments from foreign debtors. The influence of this ratio on bank lending will reveal not only the openness of the financial markets, but mainly the degree of dependence on the other countries' financial resources.

To build our panel, we use Eurostat and International Financial Statistics (IFS) quarterly data for the period from Q1 1999 to Q3 2006 (31 quarters) for 26 EU countries, amounting to 806 observations. Luxembourg has been excluded, as it was not possible to collect all the necessary data for this country.

3. Estimations and Results

Following Wooldridge (2002), we use a panel data approach which provides our estimations with more observations and reduces the possibility of multi-colinearity among the different variables. In order to control for individual country-specific effects, we use panel regressions

with fixed effects, which assume common slopes, whilst each cross section unit (here, each country), has its own intercept. So, we estimate the following linear model (all variables in natural logarithms):

$$(\text{Bank Lending/GDP})_{it} = \varphi_1 \text{ real GDP per cap.}_{it} + \varphi_2 \text{ Interest rate}_{it} + \varphi_3 (\text{Deposits/GDP})_{it} + \varphi_4 (\text{Bonds and Money Market Instruments/GDP})_{it} + \varphi_5 (\text{Foreign Assets/Foreign Liabilities})_{it} + v_t + u_{it}$$

where:

$i = 1, \dots, 26$ (EU countries)

$t = 1, \dots, 31$ (quarters, between Q1 1999 and Q3 2006)

v_t = time (quarter) dummies

u_{it} = error term

(Table 1 around here)

The consistency of the obtained results (reported in Table 1) allows us to conclude that the EU banking institutions have similar reactions to the variations in the macroeconomic conditions, in particular to the monetary policy interest rate, as well as to the variations in the bank performance conditions.

However, there remains evidence of heterogeneity and a clear difference in the obtained R squared values: they are similar (approximately 15%) both for the overall panel and for the between-countries hypothesis (testing the differences among the different countries), while the R squared within the countries, that is, when they are considered individually, rises to 45%. This allows us to conclude that the time evolution in each country is more important than the cross-similarities among the countries in the same periods of time.

Again, according to the results reported in Table 1, in all situations, only the ratio foreign assets to foreign liabilities has a negative influence on the bank lending growth, confirming

the importance of the foreign dependence and the indebtedness of the EU financial systems during this period.

All the other explanatory variables contribute positively to bank-lending growth. In addition, the relatively strong influence of the ratio bonds and money market instruments to GDP confirms that the EU financial and credit systems continue to be bank-dominated, since the increase of the bonds and money market instruments are in line with the bank-lending growth.

The positive contribution of the monetary policy interest rate to bank lending is not a surprise, in view of the fact that during the considered period, the European Central Bank in particular, as well as the central banks of the non-EMU member-states, maintained interest rates at historically low levels, thereby contributing to the growth of the ratio bank lending to GDP.

4. Concluding remarks

Following the proposed vectors of analysis and according to the obtained results, we conclude that, during the considered time period:

- 1) In spite of the differing initial conditions, the EU financial institutions react in the same way and confirm the increased European financial integration;
- 2) The bank-lending growth reacts positively to the particular macroeconomic conditions and increases not only with the growth in real GDP, but also with the historically low monetary policy interest rates;
- 3) The bank performance conditions are particularly relevant to the growth of bank lending.

More precisely, we confirm the importance to bank lending of the bank deposits as a resource for the provision of credit, as well as the development of the European financial markets, here represented by the ratio bonds and money market instruments to GDP.

On the other hand, the clear negative influence of the ratio foreign assets to foreign liabilities on bank-lending growth reveals the high degree of foreign dependence and indebtedness of the EU financial systems during this period.

In sum, bank lending is an essential transmission channel of monetary policy decisions in EU countries, but it depends on the performance conditions of the different financial institutions.

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Table 1 - Panel Fixed Effects Estimations

	Estimated Coefficient	Standard Error	T - Statistic	P - Value
Real GDP	.1787042	.0906129	1.97	0.049
Interest rate	.1293654	.0318979	4.06	0.000
Deposits/ GDP	.1997731	.0326271	6.12	0.000
Bonds and Money Market Instruments/GDP	.1391677	.014301	9.73	0.000
Foreign Assets/Foreign Liabilities	-.1088265	.0195928	-5.55	0.000
N = 806				
R-squared: within= 0.4505; between=0.1423; overall=0.1554				
corr(u _i , X _b) = -0.0545				
F(35,745) = 17.45; Prob > F = 0.0000				
F test that all u _i =0: F(25, 745) = 484.15 Prob > F = 0.0000				

Note: Time dummies are included in the estimation, but the results are not reported.